

Claims

1. Dry powder inhaler (1) with a mouthpiece (2) for dispersing pharmaceutical drug formulations, having an auxiliary energy source in the form of a pressure medium system (3), with a device for provisioning (6) of a powder formulation (7), whereby upon activation of the pressure medium system a gaseous pressure medium (8) released by the pressure medium system (3) forms with the powder formulation (7) an aerosol (9) in such a way that the powder particles are present in dispersed form within the gaseous pressure medium (8), **characterized in that** provided in the inhaler (1) is a nozzle (10) through which the aerosol (9) flows before leaving the inhaler (1).
2. Dry powder inhaler (1) according to Claim 1, **characterized in that** the nozzle (10) is configured as an aperture plate.
3. Dry powder inhaler (1) according to Claim 1, **characterized in that** the nozzle (10) exhibits a narrowing inlet section (11) that connects to an aperture plate.
4. Dry powder inhaler (1) according to Claim 1, **characterized in that** the nozzle (10) exhibits a narrowing inlet section (11), a middle piece (13) and a widening outlet section (12) that connects to the middle piece (13).
5. Dry powder inhaler according to Claim 4, **characterized in that** the narrowest cross section is located in the middle piece (13).
6. Dry powder inhaler (1) according to Claim 5, **characterized in that** the nozzle (10) is a Laval nozzle.
7. Dry powder inhaler (1) according to Claims 4 to 6, **characterized in that** the narrowest cross section (14) of the nozzle (10) is 100 μm to 1500 μm , preferably 400 μm to 800 μm , in diameter.
8. Dry powder inhaler (1) according to one of the Claims 4 through 7, **characterized in that** the nozzle (10) exhibits an outlet section (12) that widens in such a way that the

pressure medium (8) is accelerated to supersonic speed in the outlet section (12).

9. Dry powder inhaler (1) according to one of the preceding Claims, **characterized in that** the pressure medium system (3) exhibits a pump that is connected to the surroundings and uses ambient air as the pressure medium (8).
10. Dry powder inhaler (1) according to one of the Claims 1 through 8, **characterized in that** the pressure medium system (3) includes a cartridge that stores a pressurized pressure medium (8).
11. Dry powder inhaler (1) according to one of the preceding Claims, **characterized in that** air is provided as the pressure medium (8).
12. Dry powder inhaler (1) according to one of the Claims 1 through 8 or 10 through 11, **characterized in that** N₂, CO₂, Ar or He is provided as the pressure medium (8).
13. Dry powder inhaler (1) according to one of the preceding Claims, **characterized in that** the device for provisioning (6) of the powder formulation (7) is placed between the pressure medium system (3) and the nozzle (10) in such a way that the pressure medium (8) must pass through the device (6).
14. Dry powder inhaler (1) according to one of the preceding Claims, **characterized in that** the device for provisioning (6) of the powder formulation (7) is exhibits a capsule (15) filled with powder (7).
15. Dry powder inhaler (1) according to one Claim 14, **characterized in that** the capsule (15) is replaceable as an expendable item.
16. Dry powder inhaler (1) according to one of the Claims 1 through 13, **characterized in that** the device for provisioning (6) of the powder formulation (7) includes a multidose blister container.
17. Dry powder inhaler (1) according to one of the Claims 1 through 8 or 10 through 16, **characterized in that** provided in the mouthpiece (2) is a flow rate sensor (19) that generates an input signal for the pressure medium system (3).

18. Dry powder inhaler (1) according to one of the preceding Claims, **characterized in that** a swirling flow of inhalation air that is drawn in through an inlet channel is created between the outlet section (12) and the outlet of the mouthpiece (2).
19. Dry powder inhaler (1) according to one of the preceding Claims, **characterized in that** the nozzle (10) and an inlet channel (18) for the inhalation air are arranged in such a way that the aerosol flow leaving the nozzle (10) and the inhalation air are directed in opposite directions (Fig. 7).
20. Dry powder inhaler (1) according to one of the Claims 1 through 19, **characterized in that** the nozzle (10) and an inlet channel for the inhalation air are arranged in such a way that the aerosol flow leaving the nozzle and the inhalation air collide with each other at an angle.
21. Dry powder inhaler (1) according to one of the Claims 1 through 20, **characterized in that** the channel (30) that guides the aerosol flow and the inlet channels (18) for the inhalation air empty into a swirl chamber (29); the aerosol cloud is directed from there to the nozzle (10) (Fig. 6).